House Science Committee-Subcommittee on Energy – Hearing

Competition for Department of Energy Laboratory Contracts: What is the Impact on Science?

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National Laboratories Overview

Madam Chairman, I am grateful for the opportunity to share with you some of my perspectives on the DOE National Laboratories management and some of the issues raised by the current concern for the status and trajectory of the GOCO and M&O contract concept.

My background and past affiliations with many of these laboratories are described in my brief bio attached to these remarks, so let me not spend time on that here. Rather let me begin by stating my belief that world leadership in research and development is absolutely vital for the US; that technology based on the methods, discoveries and laws of science is the basis for innovation, productivity enhancement, and improvement in the human condition; that the position of the US is seriously threatened by a steadily declining competency in our schools in the areas of science, math and technology; that the virtual disappearance of real research in the US industrial sector adds to this threat and puts an increasing burden on our universities and national laboratories to fill the resulting gaps.

The main missions of the DOE multiprogram laboratories are: national security and science. The former embraces economic and energy security as well as physical security. The latter embraces technology development appropriate to the security mission as well as large facility based fundamental research. In order to fulfill these vital missions, the national laboratories are necessarily large, complex, and expensive. Over the past five decades they have become more so. Thus it is increasingly important that the labs operate efficiently and effectively. I believe that despite some managerial shortcomings at virtually all levels the DOE labs as a group have done an outstanding job in meeting these challenges. As a group they are superior to any other set of FFRDC's.

GOCO - M&O Concept

Much of the credit for this record goes to the GOCO-M&O concept. As Sig Hecker has detailed in his testimony to the Senate Energy and Natural Resources Committee on June 24, 2003 the GOCO relationship began as a partnership that was deliberate and innovative. For several decades it was also quite successful. The Congress and the agency [first the AEC and then the DOE] set the missions and strategic objectives, and the Management and Operations Contractor was responsible for their execution. Motivation for becoming an M&O contractor in those days was in large measure related to the 'opportunity to render an exceptional service in the national interest' – to quote from President Truman's letter to the then president of the Bell System [AT&T] requesting him to accept the management of Sandia National Laboratories. Similar

motivation surely played a dominant role in the University of California's management of its three national laboratories.

Though conceived and initially implemented for the weapons laboratories, the M&O GOCO model was successfully adopted for the DOE's science laboratories as well. Aspects of the 'inherently governmental function' associated with nuclear weapons laboratories – namely long term commitment, superb technical judgment , complex science and engineering projects, and operation of unique and expensive facilities- were and are still also to be found in the DOE science laboratories. They house and host facility based fundamental research in particle and nuclear physics, in chemical, materials and computational science and increasingly in biology. For several decades successive generations of large scale science facilities and projects have successfully operated under the GOCO M&O paradigm. Though the short term stakes for the nation appear higher when it comes to effective management of the DOE weapons labs, I believe that the long terms stakes are equally high for the science labs.

In the past decade and a half or so there have been numerous changes in the technological and geopolitical landscapes with the result that the GOCO concept has come under increasing criticism and has experienced serious distortion if not complete destruction. Too numerous and complex to describe here, these include changes in the nature of threats to our national security, expansion of global markets and technology bases, shrinkage of US industry supported basic research , increasing dependence on foreign technical talent, an increase in the litigiousness of our society, and the growth of government bureaucracy. For the DOE labs these changes have meant a distortion of the partnership mentality which once characterized the DOE – contractor relationship into one of a more vendor-supplier relationship characterized by ever increasing oversight, audits, orders, compliance requirements and micromanagement. Contractors were given more oversight and greater liability, while having less authority and autonomy.

The Sandia- AT&T Experience

This distortion has had many negative consequences- several of which have been documented in the Galvin Report [*Alternative Futures for the Department of Energy National Laboratories*] of 1995. I experienced many of these effects first hand as Vice President of Research and Exploratory Technology at Sandia in 1992 and 1993. The infamous 'Tiger Teams' under then Secretary Watkins had just completed their work at Sandia. In their wake was left a seemingly unending set of orders, rules, directives and procedures, indicative of an approach DOE was to follow for years hence: increased audits and paperwork, a mode of compliance rather than cooperation. This approach led to decreased scientific and technological productivity, increased staff both inside and outside the lab dedicated to preparing for endless audits and policing compliance, confusion about lines of authority and accountability and a noticeable erosion of the sense of trust and teamwork so necessary for a productive partnership.

I had gone to Sandia expecting renewal of the AT&T M&O contract due in October of 1993, only to find soon after my arrival that the DOE and AT&T were not going to renew their 45 year old relationship. AT&T's management of Sandia stood out as one of the finest examples of a contractor performing 'exceptional service in the national interest'. But with the DOE's decision not to renew its presidential indemnification of AT&T and the increasing replacement of

oversight for trust, AT&T declined to be considered for a contract renewal. Additional factors such as the profound change the corporation itself was experiencing as a result of the 1984 break up of the Bell System were undoubtedly also involved.

The contract was thus open to the long, complex, and expensive bidding process. As I recall dozens of potential bidders attended the first briefings in 1992 and eight eventually went through the entire bidding process – at considerable expense to themselves and considerable disruption, uncertainty and angst to thousands of Sandians. The bidders were down selected to two finalists: Battelle and Martin Marietta [now Lockheed Martin] , the eventual winner.

I remained at Sandia until Sept. 30, 1993 and participated in the transition before returning to Bell Laboratories. In this case the decision to compete the contract was made not out of any concern on the part of DOE for the performance of AT&T as M&O contractor [they had never collected any fee, despite being a 'for profit' corporation, and had implemented a very successful management structure and philosophy at the labs] but rather out of the vacuum created by AT&T's rejection of the dramatically changed ground rules imposed by DOE. In my opinion the management staff and laboratory culture within Sandia at that time was very strong and competent, so that while there was considerable apprehension about the change of contractors, the lab has succeeded very well. Lockheed Martin has now managed Sandia for almost ten years, and was awarded a renewal of its contract in 1998.

University of California President's Council on the National Laboratories

I was given the opportunity for another view of the DOE- contractor relationship when I was invited to join the Science and Technology Panel of the UC President's Council on the National Laboratories in late1996. By then I was Dean of Engineering at the University of New Mexico and was serving on technical review committees for divisions at both Sandia and Los Alamos [as well as Berkeley and Brookhaven National Laboratories].

For nearly four years I had the opportunity to participate in the evaluation of all the technical divisions at the three UC managed laboratories. As has been repeatedly stated by others, the dominant impression from all of these reviews remains that the quality of the technical work at these DOE labs is at least excellent throughout and uniquely outstanding in certain key areas. I also observed that the day to day style of execution, the management tools and practices, indeed the very culture of the laboratories are substantially influenced by the contractor. This was as true of Sandia under AT&T as it is of Berkeley, Livermore and Los Alamos under UC, and as it was at Brookhaven under AUI.

UC is the longest standing of the M&O contractors in the DOE system. They have therefore experienced in the greatest measure changes in the operation of the GOCO concept, and I was able to observe that as well as some of UC's reactions to them.

Secretary of Energy's Laboratory Operations Board

The events outlined above were by no means unique, and the DOE commissioned a comprehensive study of the management of its entire suite of laboratories [perhaps not entirely coincidentally] shortly after the demise of the AT&T contract. The DOE's principle response to the resulting Galvin Report was the formation by then Secretary O'Leary of the Laboratory Operations Board, tasked to advise her on ways to implement the Galvin recommendations and to generally improve the strategic planning and operations of the DOE Laboratories.

The Board originally consisted of eight external members and eight internal DOE members. Deputy Secretary Charles Curtis and retired Ford executive John McTague co-chaired the LOB in its early days. While it is difficult to assess the impact of such committees, one clearly positive aspect of the LOB was the quarterly convening in the same room of a set of external [mostly industry] members with their DOE counterparts as a committee together with the Assistant Secretaries from all of the DOE headquarters offices. We were told more than once that this was a unique collection. We worked hard to change it from a collection to a system- but without much evident success.

Much of our effort in the LOB was aimed at understanding and simplifying the relationships between the DOE and its contractors and laboratories. In many quarters a strong CYA [cover your anatomy] mentality had developed, associated with proliferating audits from the OMB, GAO and IG- like organizations. Typically the DOE had responded by adding more audits and layers of staff. The sense of partnership with the contractors continued to erode. The unbelievably convoluted 'management chain' involving the DOE HQ, field offices, area offices, site officers, contractors, and internal lab management defied rational analysis. [For those interested I commend to their attention Figure I-l on page I-9 of the Institute for Defense Analysis Paper P-3306 of March 1997. The paper is entitled "*The Organization and Management of the Nuclear Weapons Program*"].

The LOB addressed many concerns, but to me our primary objective was to improve the efficiency of laboratory operations so that the best efforts of the best technical staffs could properly execute the missions of science and national security. To this end we engaged many issues, carried out many studies and wrote many reports. These can be traced through, for example :*Contributions and Value of the Laboratory Operations Board-December 7,2000; White Paper on Performance Based Management-Dec.7,2000; Review of the DOE's Laboratory Directed Research and Development Program- Jan.2000; Analysis of Headquarters and Field Structure Issues –September 1997*. All are available through the website: http://www.seab.energy.gov/publications/pubs.htm.

I believe there have been some improvements in the subsequent years with regard to several of the issues the LOB considered : progress toward reducing 'stealth overhead'; clarifying lines of authority especially with the identification of Principal Secretarial Officers; willingness to pilot simplifying reforms at one or two labs prior to directing their system wide adoption; restoration of the LDRD ceiling to a reasonable level, etc. However, there is still very much to be done.

In my opinion we have barely begun to exploit the increases in efficiency envisioned in the Galvin report [30 to 50%]. Such increases are still possible, but not by continued piling on of more rules and compliance checkers, nor by merely trading out one contractor for another, possibly more compliant replacement. Rather the restoration of the practice of the GOCO concept to its former partnership based status is necessary. *A high level commission of the Galvin type is needed now in my opinion to reverse the negative trends that have recently begun to undo the modest progress that was beginning to be made and to position the laboratories to execute their increasingly vital national missions more efficiently.*

Going forward with M&O Contracts

Let me turn now to some questions related to the competing of M&O contracts in today's world. I do not believe the problems can be fixed by merely tweaking the current reactive approach that intimidates or penalizes an incumbent contractor with the threat of competing their contract or by adding more layers of oversight and micromanagement to new contracts.

I believe that in view of the basic soundness of the GOCO concept for the management of these laboratories and the deterioration of the practical execution of that concept, there is an urgent need for strong and visible commitment on the part of Congress and the Department to restore it. Such a commitment will influence substantially and, I believe positively, all of the contractor related questions with which we are concerned here today. Failure to make such a commitment will restrict the pool of potential contractors, will influence negatively their motivation and may result in new contracts and contractors who are willing to operate in a compliance mode, even if that means compromising [perhaps as an unintended consequence] the vital missions of the laboratories.

I believe that the attributes of a good M&O contractor include:
-Experience in efficiently managing mission oriented, complex technical organizations.
-Experience in efficient planning, constructing and operating large, complex scientific research facilities.
-Ability to recognize, recruit, retain, and reward the best scientific and technical talent.
-Sufficient internal expertise and personnel to provide sustained technical and operational leadership.
-Sufficient 'clout' to push back on ill conceived directives from the Department
-A true sense of service to the nation.
-Absence of conflict of interest.

Among the for-profit organizations, it is difficult to imagine a company like AT&T or Dupont being interested or willing to bid for a DOE M&O contract in today's environment. Defense, aerospace or environmental firms might well be willing – certainly they were in evidence during the Sandia process in 1993. Issues of management fees, reward structure and potential conflict of interest all come strongly into play with such candidates. Nevertheless, there is at least some evidence that these issues can be managed. There remains, however, at least for me a concern for the level of in-house understanding of and commitment to science and basic research with such bidders.

Among universities, there are few if any universities that have the breadth of capabilities to match the University of California and none that have their experience. Nevertheless there may be some with sufficient intellectual, managerial and financial resources to mount competitive bids. Partnerships between universities and not-for-profit organizations have been forged and are today operating some science labs with evident success. So partnerships appear to be an attractive option. However, they involve additional interfaces and the need for particular attention to delineation of roles and responsibilities which may not prove workable for a weapons laboratory.

It is perhaps worth commenting on the question of laboratory culture. This colors significantly the laboratory's approach to accountability, efficiency, safety, security, trust between scientist and manager and a host of other 'soft' issues. Over the decades each laboratory has developed its own culture which has been influenced noticeably by the M&O contractor. One only has to compare Sandia with Los Alamos or Berkeley with Brookhaven to see this. An important goal in considering any contractor is in my opinion to ingrain safety, efficiency, accountability and security in the modes of mission work itself for every employee and to reduce the need for overseers and auditors. This is perhaps too idealistic a goal in today's world, but a commitment to working in that direction will do a lot for morale of the scientists and would expand the pool of potential bidders.

On the question of *what can be done to 'better align the incentives of science professionals at the laboratories with those of the contractors?'*, I would say that the contract should make clear that delivering on the mission is paramount. What is not paramount is counting the number of orders complied with or the number of staff hired to oversee their compliance. Any contract provisions that put process or order compliance at odds with achievement of the science and security missions will naturally set the contractor and the scientists at odds.

How can we ensure that those most capable of doing the job will actually take it on?
What should incentives be for contractors? I believe the most compelling incentive will be to break the cycle of micromanagerial oversight-orders-audits-compliance checking-increasing bureaucracy-resulting inefficiency-penalties and threats that now exists. Some progress had been made in this direction during the latter half of the 1990's, but we are now slipping back noticeably. Hence my call above for a visible commitment from Congress and the department to rectify these trends.

I realize that this can not be done all at once, but some initial steps might involve:
-Increased focus on mission outcomes rather that process compliance.
-Fewer, less redundant and better coordinated audits and reviews of technical and operational performance.
- Allowing resources saved by efficiency improvements to be reinvested for more science.
- Increasing size of programs managed per manager to reduce stealth overhead.
-Reward good performance with less frequent contract recompetes or threats thereof.
- Identify steps toward working together to solve a problem [e.g. inappropriate accounting charges] before taking punitive action

Summary of Main Points

1- Science and National Security are the main missions of the DOE multiprogram national laboratories.
2- These vital missions require that these laboratories be large, complex, and expensive.
3- These attributes require that the laboratories attract the very best technical talent and be operated efficiently.
4- Changes in the geopolitical, economic and technology landscapes have made the labs more important than ever to the nation.
5- The GOCO –M&O concept was well conceived and well practiced for several decades at the national labs, but has been severely distorted by micromanagement and compliance driven approaches that substantially reduced much needed mutual trust.
6- The Galvin Task Force, the LOB and other committees have identified several aspects of the GOCO breakdown and have suggested solutions which have not been implemented.
7- Strong commitment by the congress and the DOE to restore to the GOCO-M&O practice its former trust is needed to attract qualified bidders with the requisite commitment to 'exceptional service in the national interest'.
8- It is time for a follow up to the Galvin Task Force in order to give sufficient visibility and clout to the steps needed for reform.

Thank you for the opportunity to share my thoughts on these important matters with you today.

Respectfully submitted.

Paul Fleury
July 10, 2003.